

CLAIMS:

1. A method of forming a void region associated with a substrate, comprising:

providing a substrate;

forming a sacrificial mass over the substrate;

subjecting the mass to hydrogen to convert a component of the mass to a volatile form; and

volatilizing the volatile form of the component from the mass to leave a void region associated with the substrate.

2. The method of claim 1 wherein the component comprises carbon.

3. The method of claim 1 wherein the component comprises boron.

1 4. A method of forming a void region associated with a
2 substrate, comprising:

3 providing a substrate;
4 forming a sacrificial mass over the substrate;
5 forming a metal-comprising layer over the mass; and
6 subjecting the mass to conditions which transport a component of
7 the mass to the metal-comprising layer, the transported component being
8 alloyed into the metal-comprising layer and leaving a void region between
9 the metal-comprising layer and the substrate.
10

11 5. The method of claim 4 wherein:
12 the sacrificial mass comprises a volume;
13 the subjecting the mass to conditions to transport a component of
14 the mass comprises subjecting the mass to a temperature of greater than
15 or equal to about 400°C; and

16 the mass is patterned by exposing only portions of the volume to
17 the temperature of greater than or equal to about 400°C.
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19 6. The method of claim 5 wherein the mass is patterned to
20 form a column between the substrate and the metal-comprising layer.
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1 7. The method of claim 4 wherein less than all of the
2 sacrificial mass is transported to the metal-comprising layer.

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4 8. The method of claim 4 wherein substantially all of the
5 sacrificial mass is transported to the metal-comprising layer.

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7 9. The method of claim 4 wherein the metal-comprising layer
8 comprises one or more of vanadium, zirconium, titanium, tantalum
9 chromium or iron.

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11 10. The method of claim 4 wherein the metal-comprising layer
12 comprises one or more of titanium or tantalum, wherein the component
13 is carbon, and wherein the component is alloyed as one or both of a
14 metal-carbide and a solid solution.

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16 11. The method of claim 4 wherein the component is carbon.

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18 12. The method of claim 4 wherein the sacrificial mass consists
19 essentially of carbon and the component is carbon.

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21 13. The method of claim 4 wherein the component is boron.

1 14. The method of claim 4 wherein the conditions comprise
2 exposing the mass to hydrogen gas.

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4 15. The method of claim 4 wherein the conditions comprise
5 exposing the mass to hydrogen gas and a temperature of greater than
6 or equal to about 400°C.

7
8 16. The method of claim 4 wherein the conditions comprise
9 exposing the mass to hydrogen gas and a temperature of greater than
10 or equal to about 400°C, the method further comprising:

11 exposing the substrate to the hydrogen gas, the hydrogen gas
12 permeating the metal-comprising layer and reacting with the component
13 of the mass to hydrogenate said component, the transporting comprising
14 transporting the hydrogenated component to the metal-comprising layer;

15 the hydrogenated component reacting with metal of the metal-
16 comprising layer to release hydrogen from the hydrogenated component
17 and leave the component alloyed with the metal-comprising layer;

18 the released hydrogen permeating the metal-comprising layer and
19 exiting from the metal-comprising layer.
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1 17. A method of forming a dielectric region, comprising:
2 providing a substrate;
3 providing a well associated with the substrate;
4 forming a sacrificial mass within the well;
5 forming a metal-comprising layer proximate the mass; and
6 subjecting the mass to conditions which transport a component of
7 the mass to the metal-comprising layer, the transported component being
8 alloyed by the metal-comprising layer and leaving a void region in the
9 well.

10
11 18. The method of claim 17 wherein the well is defined by
12 sidewalls extending outwardly from the substrate, the sidewalls having
13 outermost surfaces, the well being between the sidewalls; and wherein the
14 metal-comprising layer is formed over the outermost surfaces of the
15 sidewalls.

16
17 19. The method of claim 18 wherein the sidewalls comprise an
18 insulative material.

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20 20. The method of claim 18 wherein the sidewalls comprise a
21 conductive material.
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1 21. The method of claim 18 wherein the sidewalls comprise a
2 metal that does not react with the component under the conditions
3 utilized to transport the component.

4
5 22. The method of claim 18 wherein the component comprises
6 carbon, the sidewalls comprise one or more of Cu, Ag, or Au, and the
7 metal-comprising layer comprises one or more of Ti or Ta, Zr, V, Fe
8 and Cr.

9
10 23. The method of claim 17 wherein the well extends to within
11 the substrate.

12
13 24. The method of claim 17 wherein the substrate comprises
14 monocrystalline silicon.

15
16 25. The method of claim 17 wherein the component is carbon.

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18 26. The method of claim 17 wherein the component is boron.

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20 27. The method of claim 17 wherein the conditions comprise
21 exposing the mass to hydrogen gas.

28. A method of forming a dielectric region, comprising:
providing a substrate;
providing a well associated with the substrate;
forming a carbon-containing material within the well;
forming a metal-comprising layer over the carbon-containing layer;
and
subjecting the carbon-containing material to conditions which
transport carbon from the carbon-containing material to the metal-
comprising layer, the transported carbon leaving a void region in the
well.

29. The method of claim 28 wherein the conditions which
transport carbon comprise hydrogenating the carbon to form methane.

30. A method of forming a dielectric region, comprising:
providing a substrate;
providing a well associated with the substrate;
forming a boron-containing material within the well;
forming a metal-comprising layer over the boron-containing layer;
and
subjecting the boron-containing material to conditions which
transport boron from the boron-containing material to the metal-
comprising layer, the transported boron leaving a void region in the well.

31. The method of claim 30 wherein the conditions which
transport boron comprise hydrogenating the boron to form B_2H_6 .

1 32. A method of forming a dielectric region, comprising:
2 providing a substrate;
3 providing a well associated with the substrate, the well having a
4 narrow region and a wide region;
5 forming a sacrificial mass within the narrow region of the well;
6 forming a metal-comprising layer over the wide region of the well;
7 and
8 subjecting the mass to conditions which transport a component of
9 the mass to the metal-comprising layer, the transported component being
10 alloyed by the metal-comprising layer and leaving a void region in the
11 well.

12
13 33. The method of claim 32 wherein the sacrificial layer is
14 formed within the wide region of the well.

15
16 34. The method of claim 32 wherein the sacrificial layer fills the
17 well.

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19 35. The method of claim 32 wherein the component comprises
20 carbon.

1 36. The method of claim 32 wherein the component comprises
2 boron.

3
4 37. A method of forming a capacitor construction, comprising:
5 forming a first capacitor electrode over a substrate;
6 forming a sacrificial material proximate the first capacitor electrode;
7 forming a second capacitor electrode proximate the sacrificial
8 material, the second capacitor electrode being separated from the first
9 capacitor electrode by the sacrificial material;

10 subjecting the sacrificial material to hydrogen to convert a
11 component of the mass to a volatile form; and

12 transporting the volatile form of the component from the sacrificial
13 material to leave a void region between the first and second capacitor
14 electrodes.

15
16 38. The method of claim 37 wherein the component comprises
17 carbon.

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19 39. The method of claim 37 wherein the component comprises
20 boron.

1 40. The method of claim 37 further comprising forming a
2 dielectric material layer between the capacitor electrodes.

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4 41. The method of claim 40 wherein the dielectric material layer
5 comprise at least one of silicon dioxide and silicon nitride.

6
7 42. A method of forming a capacitor construction, comprising:
8 forming a first capacitor electrode over a substrate;
9 forming a sacrificial material proximate the first capacitor electrode;
10 forming a second capacitor electrode proximate the sacrificial
11 material, the second capacitor electrode being separated from the first
12 capacitor electrode by the sacrificial material;

13 at least one of the first and second electrodes being a metal-
14 comprising layer; and

15 subjecting the sacrificial material to conditions which transport a
16 component from the sacrificial material to the metal-comprising layer, the
17 transported component leaving a void region between the first and
18 second capacitor electrodes.

19
20 43. The method of claim 42 wherein the component comprises
21 carbon.

1 44. The method of claim 42 wherein the component comprises
2 boron.

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4 45. The method of claim 42 wherein both of the first and
5 second electrodes are metal-comprising layers.

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7 46. The method of claim 42 wherein both of the first and
8 second electrodes are metal-comprising layers, and wherein the component
9 is transported to only one of the metal-comprising layers.

10
11 47. The method of claim 42 wherein both of the first and
12 second electrodes are metal-comprising layers, and wherein the component
13 is transported to both of the metal-comprising layers.

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15 48. The method of claim 42 further comprising forming a
16 dielectric material layer between the capacitor electrodes.

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18 49. The method of claim 48 wherein the dielectric material layer
19 comprise at least one of silicon dioxide and silicon nitride.

1 50. The method of claim 42 wherein the component is
2 transported to the first capacitor electrode, the method further
3 comprising forming a supporting metal layer against the first capacitor
4 electrode.

5
6 51. The method of claim 50 wherein the supporting metal layer
7 comprises palladium.

8
9 52. The method of claim 42 wherein less than all of the
10 sacrificial material is transported to the metal-comprising layer.

11
12 53. The method of claim 42 wherein substantially all of the
13 sacrificial material is transported to the metal-comprising layer.

14
15 54. The method of claim 42 wherein the metal-comprising layer
16 comprises one or more of vanadium, zirconium, titanium, tantalum and
17 iron.

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19 55. The method of claim 42 wherein the metal-comprising layer
20 comprises one or more of titanium or tantalum, wherein the component
21 is carbon, and wherein the component is alloyed as one or both of a
22 metal-carbide and a solid solution.
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1 56. The method of claim 42 wherein the conditions comprise
2 exposing the sacrificial material to hydrogen gas.

3
4 57. The method of claim 42 wherein the conditions comprise
5 exposing the sacrificial material to hydrogen gas and a temperature of
6 greater than or equal to about 400°C, the method further comprising:

7 exposing the substrate to the hydrogen gas, the hydrogen gas
8 permeating the metal-comprising layer and reacting with the component
9 of the sacrificial material to hydrogenate said component, the transporting
10 comprising transporting the hydrogenated component to the metal-
11 comprising layer;

12 the hydrogenated component reacting with metal of the metal-
13 comprising layer to release hydrogen from the hydrogenated component
14 and leave the component alloyed in the metal-comprising layer;

15 the released hydrogen permeating the metal-comprising layer.
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1 58. A void forming method comprising:
2 providing a first material, a second material, and a sacrificial mass
3 between the first and second materials;

4 exposing selected portions of the sacrificial mass to conditions
5 which hydrogenate said selected portions while leaving other portions of
6 the sacrificial mass unexposed to such conditions, the exposing volatilizing
7 the selected portions to form at least one void within the sacrificial mass
8 and between the first and second materials.
9

10 59. The method of claim 58 wherein at least one of first and
11 second materials is a metal-comprising material, and wherein the
12 volatilizing transfers a hydrogenated component from the selected portions
13 to the metal-comprising material.
14

15 60. The method of claim 59 wherein both of the first and
16 second materials are metal-comprising materials.
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18 61. The method of claim 58 wherein the sacrificial mass
19 comprises carbon.
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21 62. The method of claim 58 wherein the sacrificial mass
22 comprises boron.
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1 63. The method of claim 58 wherein the void is configured to
2 be a conduit for fluid flow.

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4 64. The method of claim 58 wherein the void is configured to
5 be a column for gas chromatography.

6
7 65. The method of claim 58 wherein the exposing comprises
8 exposing an entirety of the sacrificial mass to hydrogen and selectively
9 heating the selected portions to a temperature greater than or equal to
10 about 400°C while not heating the other portions of the sacrificial mass.

11
12 66. The method of claim 65 wherein the selective heating is
13 accomplished with a laser.

1 67. A capacitor forming method comprising:
2 providing a semiconductor wafer;
3 forming first and second capacitor electrode layers over the
4 substrate and forming a sacrificial mass layer over the substrate, the
5 sacrificial mass layer being between the first and second capacitor
6 electrode layers; and
7 exposing selected portions of the sacrificial mass layer to conditions
8 which hydrogenate said selected portions while leaving other portions of
9 the sacrificial mass unexposed to such conditions, the exposing volatilizing
10 the selected portions to form voids within the sacrificial mass, the voids
11 being at selected locations where capacitors are to be formed and
12 comprising dielectric layers of such capacitors.

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14 68. The method of claim 67 wherein the voids are formed to
15 different thickness for different of the capacitors.
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1 69. The method of claim 68 wherein the exposing comprises:

2 exposing an entirety of the sacrificial mass to hydrogen and
3 selectively heating the selected portions to a temperature greater than or
4 equal to about 400°C while not heating the other portions of the
5 sacrificial mass; and

6 heating some of the selected portions for longer periods of time
7 than others of the selected portions to form the voids of different
8 thicknesses.

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10 70. The method of claim 67 wherein the sacrificial mass
11 comprises carbon.

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13 71. The method of claim 67 wherein the sacrificial mass
14 comprises boron.

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16 72. The method of claim 67 wherein the exposing comprises
17 exposing an entirety of the sacrificial mass to hydrogen and selectively
18 heating the selected portions to a temperature greater than or equal to
19 about 400°C while not heating the other portions of the sacrificial mass.

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21 73. The method of claim 72 wherein the selective heating is
22 accomplished with a laser, focused light source, or heated metal contact.
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1 74. The method of claim 67 further comprising forming a
2 dielectric material layer between the capacitor electrodes.

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4 75. The method of claim 74 wherein the dielectric material layer
5 comprise at least one of silicon dioxide and silicon nitride.

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7 76. The method of claim 67 wherein volatilizing transports a
8 component from the sacrificial mass to the first capacitor electrode, the
9 method further comprising forming a supporting metal layer against the
10 first capacitor electrode.

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12 77. The method of claim 76 wherein the supporting metal layer
13 comprises palladium.